

I. REAL PARTY IN INTEREST

The real party in interest is the owner, by assignment, Molex, Inc. , which uses the devices and methods disclosed in the subject application.

II. RELATED APPEALS AND INTERFERENCES

One other "related" application is pending, U.S. Patent Application Serial No. 09/660,907, filed on September 13, 2000. A Notice of Appeal was filed in this application on May 13, 2002, and it is expected that applicants shall appeal the Final Rejection of that application, as well as the present application.

III. STATUS OF CLAIMS

This is an appeal from the Final Rejection (Paper No. 10), mailed October 22, 2001. Claims 1-11 and 13-21, all of the claims currently pending in the application, have been finally rejected. No claims have been allowed.

IV. STATUS OF AMENDMENTS

In an Advisory Action (Paper No. 12), mailed February 28, 2002, the Examiner indicated that applicants' Rule 116 response, filed January 22, 2002, will not be entered for appeal purposes.

V. SUMMARY OF INVENTION

The present invention is directed to a shielded receptacle connector. The design of the connector enables the size, weight and manufacturing cost of the connector to be reduced in comparison to prior art connectors used in similar applications. These improvements are realized without impairing the structural integrity of the connector.

Generally speaking, the above improvements are accomplished by providing an internal insulative connector housing having a rear body portion and top and bottom walls, without any sidewalls interconnecting the top and bottom walls together. A plurality of conductive terminals are supported within the housing. A receptacle portion of the connector is formed in cooperation with the top and bottom walls of the connector housing using a pair of metal sidewalls formed by bending a shield member around the sides of the connector housing. The shield provides shielding for the connector and also

serves to retain the opposing connector in mating engagement with receptacle connector by way of three retention members that extend in and engaged the opposing connector in three different directions.

A metal shell is provided that overlies a portion of the connector housing and also overlies a portion of the shield member, retaining the shield in its place upon the housing. A top surface of the housing includes a front portion which is recessed with respect to the rear portion of the top surface. The front portion is recessed to a depth which approximately matches the combined material thicknesses of the metal shield and the metal shell overlying the shield. This allows the exterior surface of the metal shell to be flush with the surface of the metal shield covering the rear portion of the housing, helping to minimize the size of the connector.

The structure of the invention provides at least two distinct advantages, which are:

(1) Using portions of the metal shield member to perform the function of the housing sidewalls (as well as performing the shielding function) allows the overall size and weight of the connector to be minimized while providing shielding and maintaining the mechanical strength of the connector. (Page 5, lines 15-22; page 6, lines 7-13).

(2) Use of the metal shell to overlap and retain the shield member on the connector housing also contributes to minimization of the overall size of the connector. In addition, the number of features which must be formed into the metal shield to position and secure the shield independently on the housing can be reduced. This reduces manufacturing costs by reduces the number and complexity of the operations needed to assemble the connector.

VI. ISSUES

A. Whether claims 1-14 and 21 are unpatentable under 35 U.S.C. 103(a) as obvious from Wu et al. (U.S. Patent No. 6,086,421) in view of Futatsugi et al. (U.S. Patent No. 6,077,120) and further in view of Wang (U.S. Patent No. 6,095,869).

B. Whether claims 17, 18 and 20 are unpatentable under 35 U.S.C. 103(a) as obvious from Futatsugi et al. in view of Matsunuma et al. (US 5,993,258) and Wang.

C. Whether claim 19 is unpatentable under 35 U.S.C. 103(a) as obvious from Futatsugi et al. and Matsunuma et al. as applied to claim 17, and further in view of Wu et al.

VII. GROUPING OF CLAIMS

The appealed claims 1-11 and 13-21 are grouped together as follows:

A. Claims 1-3, 6, 10-12, 14-16 are claims which read on embodiments of the connector shown in FIGS. 1, 3, 4, 11 and 12.

B. Claims 4-9 are claims which read on embodiments of the connector shown in FIGS. 1, 3, 4 and 10.

C. Claim 13 is a claim which reads on embodiments of the connector shown in FIGS. 11-14.

D. Claims 17, 19, 20 are claims which read on embodiments of the connector shown in FIGS. 1, 3, 4, 11 and 12.

E. Claim 18 is a claim which reads on embodiments of the connector shown in FIGS. 11-14.

F. Claim 21 is a claim which reads on embodiments of the connector shown in FIGS. 1, 3, 4, 11 and 12.

VIII. ARGUMENT

A. Introduction

As set forth above, it should be clearly recognizable that applicants' invention is a connector designed to use portions of the metal shield member to perform the function of the housing sidewalls (as well as performing the shielding function). In doing so, the connector housing is formed without sidewalls and a separate metal shell member is used to retain the shield member upon the connector housing.

B. Rejection Of The Claims

In the obviousness rejection of claims 1-14 and 21 under 35 U.S.C. 103(a), the Examiner asserted that Wu disclosed a connector housing having a body portion with top and bottom walls defining a U-shaped cross section, and a metal shell member including a top panel portion, a bottom panel portion and two side panels forming a receptacle

cooperatively with the top and bottom wall portions on the housing. The Examiner also asserted that Wu disclosed the use of retention members having free ends and extending sideways.

The Examiner admitted that Wu failed to disclose both (1) a retainer in the form of a metal shield and (2) a connector housing not having any sidewall members. To cure these important deficiencies, the Examiner relied upon two secondary references. The Examiner first relied upon U.S. Patent No. 6,077,120 (Futatsugi et al.) and asserted that it disclosed a retainer in the form of a metal shield disposed partially over and retaining a retainer shield, the retainer shield having a retention member bent upon itself and extending downwardly into a top opening of the housing, and having a free end to shield the housing and retain an opposite connector within the connector housing. The Examiner secondly relied upon U.S. Patent No. 6,095,869 (Wang) and indicated that it disclosed a connector housing not having any sidewall members to reduce the manufacture cost.

Relying upon this combination of three references, the Examiner posited that it would have been obvious to a person of ordinary skill in the art to have selectively chosen, from Futatsugi et al., a retention member extending downwardly into a top opening of the housing and, from Wang, a connector housing having no sidewalls to reduce manufacturing costs, and to somehow add them to the connector of Wu et al. to construct a connector having a housing with top and bottom portions but no sidewalls, and having retaining members extending into a space formed by the housing top and bottom portions from three different directions.

In the obviousness rejection of claims 17, 18 and 20, the Examiner again relied upon Futatsugi et al. and Wang as combined above and further in combination with U.S. Patent No. 5,993,258 (Matsunuma et al.).

The Examiner expressly admitted that Futatsugi et al. did not disclose either (1) a plurality of retention members or (2) a connector housing not having any sidewall members. To cure these deficiencies, the Examiner asserted that Matsunuma et al. disclosed a plurality of retention members oriented in distinct vertical and horizontal planes to engage and retain a mating connector in orthogonal directions, and that Wang disclosed a connector housing not having any sidewall members to reduce manufacturing costs.

Relying upon this combination of three references, the Examiner posited that it would have been obvious to a person of ordinary skill in the art to have selectively chosen, from Matsunuma et al., retention members in addition to the retention member projecting into the housing through the top of the housing and, from Wang, a connector housing having no sidewalls to reduce manufacturing costs, and to somehow add these features to the connector of Futatsugi et al. to provide a connector having no sidewalls and at least two retention members projecting into a housing receptacle and oriented in distinct vertical and horizontal planes.

Previous amendments to the claims and remarks by Applicants were rebuffed by the Examiner in the Final Office Action mailed October 22, 2001 and in the Advisory Action mailed February 28, 2002.

C. The §103(a) Rejections Of Independent Claim 1 And Its Dependent Claims 3, 6, 10, 11 And 14 Are Incorrect And Should Be Reversed.

Independent claim 1 and claims 2, 3, 6, 10, 11 and 14 which depend therefrom are directed to a connector having an insulative housing with a body portion and distinct top and bottom wall portions extending from the body portion to define a space, the connector housing not having any sidewalls interconnecting said top and bottom wall portions together, a metal shield that overlies a portion of the connector housing, the shield having three distinct retention members formed thereon, each of the retention members extending at least partially into the space between the connector housing top and bottom wall portions for engaging opposing portions of a mating connector inserted into the space, each of the retention members also extending into the space from a different direction, and an outer metal shell having portions which overlie portions of the connector housing and including two side panels that extend vertically between the connector housing top and bottom wall portions and close off the space therebetween to define a four sided receptacle of the connector with two of the shield retention members being disposed interiorly of the shell side panels, and with the metal shield being retained in its place upon the housing by the metal shell.

None of the prior art relied upon in the Final Rejection, i.e., Wu et al., Futatsugi et al. or Wang et al. contain any disclosure or suggestion of providing a connector housing

having top and bottom wall portions with no side portions connecting the top and bottom portions, enabling retention members of a metal shield overlying the housing to extend at least partially into a space defined by the top and bottom housing portions.

Wu et al., the primary reference relied upon in the Final Rejection, discloses a connector having a single shield member partially enclosing a housing which has sidewalls formed as part of the connector housing. Accordingly, any suggestion of a housing without sidewalls cannot come from Wu et al. The Examiner has previously admitted that Wu et al. does not disclose a connector housing without sidewalls. (Page 3, Paragraph 1, October 22 Final Rejection). In order to cure this deficiency, the Examiner has relied upon Wang as a secondary reference in order to supply this critical structural feature of the invention which is lacking from Wu et al. As explained below, Wang does not cure the above deficiency.

Specifically, the Examiner asserted that “Wang discloses a connector housing (20) not having any sidewall members to reduce the manufacture cost. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form a connector housing without side walls, as taught by Wang, to reduce the manufacture cost.” (Page 3, Paragraph 1, October 22 Final Rejection).

However, a review of Wang indicates that the only issue with respect to manufacturing costs discussed in Wang relates to the length of the conductors mounted in the housing, and not to the housing itself. Column 1, lines 11-21 of Wang state (with emphasis added):

“Because the size of connectors is very small, therefore it is difficult to make the plastic shell and the conductors integral with each other, so that the machines used for manufacturing these connectors are very expensive. In order to minimize the manufacturing cost of these connectors, the conductor rack and the plastic shell are separately made, and then assembled together. For examples, U.S. Pat. Nos. 4,703,991 and 5,639,267 disclose such structure. However, the arrangement of both conductor racks require long conductors. Therefore, it is necessary to shorten the length of conductors to reduce the cost.”

Also, column 1, lines 32-35 state (with emphasis added):

“It is another object of the present invention to provide a conductor rack for an electric connector which greatly shortens the length of the conductors so that the manufacturing cost of the electric connector is reduced.”

Thus, for purposes of reducing manufacturing costs, Wang is concerned only with the lengths of the conductors and not with the connector housing. The disclosure of Wang provides no reason for the omission of sidewalls in the connector housing. Indeed, Wang is silent as to reducing cost and width and weight of the connector by eliminating a structural element of the connector housing and using a portion of an exterior metal shell to replace such element(s) and their function. Applicants submit that, because Wang does not set forth a reason for omitting sidewalls from the housing, the disclosure of Wang et al. provides absolutely no motivation to modify the connector housing of Wu et al. to produce a housing lacking sidewalls. Thus, it would not be obvious to one skilled in the art from the disclosure of Wang to provide a connector housing having no sidewalls for the purpose of reducing manufacturing costs, as asserted by the Examiner.

In addition, none of the prior art relied upon in the Final Rejection, i.e., Wu et al., Futatsugi et al. or Wang et al. contain any disclosure or suggestion of providing a metal shield that overlies a portion of a connector housing and includes retention members for retaining a mating connector in the connector housing, and an outer metal shell which retains the shield in its place upon the housing.

Wu et al., the primary reference relied upon in the Final Rejection, discloses a connector having a single shield member partially enclosing a housing which includes sidewalls. Accordingly, any suggestion of providing a metal shield that overlies a portion of a connector housing and includes retention members projecting into a space formed by the housing for retaining a mating connector in the connector housing, and an outer metal shell which retains the shield in its place upon the housing cannot come from Wu et al. The Examiner has admitted that Wu does not disclose a retainer in the form of a metal shield. (Page 2, Paragraph 3, October 22, 2001 Final Rejection). In order to cure this deficiency, the Examiner has relied upon Futatsugi et al. as a secondary reference in order to supply the critical structural features of the claimed invention which are lacking from Wu et al. As explained below, Futatsugi et al. does not cure the above deficiency.

Specifically, the Examiner relies upon Futatsugi et al. as disclosing a second metal shield member having a retention member projecting into the housing, with a first shield member disposed partially over and retaining the second shield member on the housing.

The Examiner suggests that Futatsugi et al. "teaches a retainer (40) in the form of a metal shield disposed partially over and retaining the retainer shield (see (Fig. 8)...". However, in Futatsugi et al. the forward shield member 40 is secured to the connector housing independently of rear shield member 70, and rear shield member 70 is secured to the connector housing independently of forward shield member 40.] but also secured by it

Neither shield member is used or needed to retain the other shield member in its place upon the housing, as disclosed in the present application.

The specification of Futatsugi et al. states that rear shield member 70 is mounted on the housing prior to mounting of forward shield member 40 to the housing (column 3, lines 49-67 - column 4, lines 1-43). In addition, the descriptions of how the forward and rear shield members are mounted on the housing clearly indicates that the shield members are independently secured to the housing, rather than one acting to retain the other in place upon the connector housing. With regard to the rear shield member, column 3, lines 59-67, continuing through column 4, lines 1-6 of Futatsugi et al., state:

"Next, rear shield member 70 is mounted from the rear face of the insulating housing 20 (see arrow B). The locking part 77 is moved through recess 19 in the insulating housing 20 to a specified forward position as shown in FIG. 6. The front-end projections 81 of the top wall 72 become supported by the support walls 26 of the insulating housing 20, and the engaging holes 76 interlock with the engaging projections 23 of the insulating housing 20. Pawl 78 enters hole 25 of housing 20, and lances 80 interlock with recesses 27. As is seen in FIG. 9, a central groove 28 that is aligned with the engaging hole 25 is formed in the bottom surface of the insulating housing 20, and bridge 79 engages therewith; as a result, bridge 79 guides the mounting of the shield member 70, and correctly positions the shield member 70 with respect to insulating housing 20."

With regard to forward shield member 40, column 3, lines 16-21 of Futatsugi et al. states:

"Each of the side walls 42 has an engaging hole 43 that engages with an engaging projection 22 formed on the insulating housing 20, a tongue part 44 that is positioned to the rear of the engaging hole 43, and first and second SMT type solder tabs 45a and 45b that are formed to protrude outward to the side."

Also, column 4, lines 29-43 state:

"In the fourth assembly step, forward shield member 40 is mounted from the mating face of the insulating housing 20 (see arrow C in FIGS. 7 to 9). First, the

engaging holes 43 formed in the side walls 42 of forward shield member 40, are engaged with the engaging projections 22 on both side surfaces of the insulating housing 20, and extend in the direction of length. Secondly, the tongue parts 44 positioned to the rear of the engaging holes 43 are bent in the direction indicated by arrow R, and are thus caused to undergo plastic deformation so that these tongue parts 44 are oriented as shown in FIG. 1, adjacent to angled rearwardly facing housing surfaces (FIG. 8). As a result, the forward shield member 40 is securely fastened in place with respect to the insulating housing 20."

Similarly, with regard to rear shield member 70, column 3, lines 35-48 state:

"As is shown in FIG. 1, top wall 72 has engaging holes 76 that interlock with engaging projections 23 formed on the insulating housing 20, and a locking part 77 that is formed by being bent in a U-shape at the front end as shown in FIG. 6. Front-end projections 81 positioned on both sides of the locking part 77 engage with support walls 26,26 of the insulating housing 20, and are supported thereby to prevent upward movement. Referring to FIGS. 3 and 8, bottom wall 73 includes a pawl 78 that interlocks with an engaging hole 25 formed between posts 24 of the insulating housing 20, a bridge 79 supported at both ends positioned in the approximate center of the bottom surface 73, and a pair of lances 80 that interlock with the insulating housing 20."

From the above portions of the Futatsugi et al. disclosure, it is clearly seen that each shield member is secured to the connector housing independently of the other shield member. Thus, neither forward shield member 40 nor rear shield member 70 is "retained in its place upon the housing" by the other, as called for in claims 1 and 17 of the present application. As neither Wu et al., Futatsugi et al. or Wang disclose a "shield being retained in its place upon the housing by the metal shell", no combination of these references would include this feature.

The Examiner also asserts that "retainer (40) retains wall sections (82) from being pulled away of their original position." However, the Examiner cites no specific portion of Futatsugi et al. which shows nor suggests such a purpose for forward shield member 40. The only contact between portions of the forward and rear shield members of Futatsugi et al. are for purposes of establishing a grounding connection, not for retaining either of the forward or rear shield members on the connector housing. As stated in column 4, lines 44-48 (with emphasis added):

"As is seen from FIG. 10, when the forward shield member 40 is mounted, the projections 84,84 of the rear shield member 70 become engaged with forward

shield member 40; realizing a grounding connection between the shield members 40 and 70.”

Thus, forward shield member 40 makes contact with rear shield member 70 at projections 84, 84 of rear shield member 70 for grounding purposes only , and not for the purpose of retaining rear shield member 70 in its place upon the housing.

As stated above, rear shield member 70 is secured to the connector housing independently of forward shield member 40. Thus, forward shield member 40 is neither needed nor used to help retain rear shield member 70 in its place upon the housing.

As the forward and rear shield members of Futatsugi et al. are each retained independently upon the housing, and as there is no suggestion in the reference that either shield member performs the function of retaining the other shield member upon the housing, it is clear that any suggestion of a second metal shield member having a retention member projecting into a connector housing with a first shield member disposed partially over and retaining the second shield member on the housing cannot come from Futatsugi et al.

Futatsugi et al. does not support the Examiner’s assertion that it would have been obvious to combine Futatsugi et al. with Wu et al. to provide a second metal shield member having a retention member projecting into a connector housing with a first shield member disposed partially over and retaining the second shield member on the housing .

As no suggestion of a second metal shield member having a retention member projecting into a connector housing with a first shield member disposed partially over and retaining the second shield member on the housing can come from either Wu et al. or Futatsugi et al., it is clear that no combination of these references can show or suggest the above-mentioned features.

Accordingly, as the teachings of Futatsugi et al. do not disclose a metal shield retained in its place upon a connector housing by a separate metal shell, and as Wang provides no motivation for modifying the connector of Wu et al. to provide a housing lacking sidewalls, one of ordinary skilled in the art would not have obviously combined these references as asserted by the Examiner. Indeed, any teaching of a metal shield retained in its place upon a connector housing by a separate metal shell is absent from all of the references relied upon by the Examiner.

It is applicants' belief that the Examiner, in his rejection of claims 1-14 and 21, has merely selected individual, particular features from the various references to combine them, not in light of any teaching or suggestion found in any of those references, but rather, solely with the benefit of applicants' disclosure before him.

Applicants' position echoes that set forth by the CCPA successor, the Court of Appeals for the Federal Circuit. In order to set forth a prima facie case of obviousness, the secondary or tertiary references must provide an incentive, motivation, teaching or suggestion to modify the primary reference to arrive at applicants' claimed structure. If the prior art does not suggest or provide an incentive for the modification, the combination must fail. The proper application of obviousness, combination references is set forth with particularity by the Federal Circuit in a number of cases such as In re Geiger 815 F.2d 686, 2 U.S.P.Q. 1276 (CAFC 1987) and In re Laskowski, 871 F.2d 115, 10 U.S.P.Q. 2d 1397 (CAFC 1989).

It is apparent from this series of cases that the patents relied upon by the Examiner, namely Wu et al., Futatsugi et al. and Wang must themselves contain a teaching or suggestion permitting the combination proposed by the Examiner. They do not.

The Examiner is merely selecting bits and pieces from the prior art to assemble applicants' invention with the benefit of applicants' disclosure before him. It is clear that the applicants' claims were used by the Examiner as a framework to build upon and that individual, naked parts of separate prior art references are employed by the Examiner to recreate a facsimile of the claimed invention. However, more than just a disclosure of bits and pieces or a mosaic of applicants' invention is required. As the Federal Circuit has consistently ruled, an invention is a whole and must be considered as a whole, including the problems it solves. When the problems of the invention and the prior art are compared, there is no teaching in the references to hold them together in the matter proposed by the Examiner to render obvious the subject matter claimed by applicants' in claims 1-14 and 21. Accordingly, the rejections of claims 1-14 and 21 cannot be sustained and should be reversed.

D. ¹⁶ The §103(a) Rejections Of Independent Claim 17 And Its Dependent Claims 19 And 20 Are Incorrect And Should Be Reversed.

Independent claim 17 and dependent claims 19 and 20 which depend therefrom are directed to a connector having an insulative housing, the connector housing having distinct top and bottom wall portions defining an interior receptacle, the housing not having any sidewalls interconnecting the top and bottom wall portions together, a retainer shield for shielding a portion of said connector housing, the retainer shield including a body portion that is bent to overlie at least three distinct sides of said connector housing and including at least two retention members oriented in distinct vertical and horizontal planes so as to exert a retaining force from two different directions on two different surfaces of a mating connector, and an outer shell member extending partially over the retainer shield, the retainer shield being retained in its place upon the housing by the outer shell member.

None of the prior art relied upon in the Final Rejection, i.e., Futatsugi et al., Matsunuma et al. or Wang et al. contain any disclosure or suggestion of a retainer shield for shielding a portion of said connector housing, and an outer shell member extending partially over the retainer shield, the retainer shield being retained in its place upon the housing by the outer shell member

In the Final Rejection with respect to claims 17, 18 and 20, the Examiner asserted that "Futatsugi discloses a connector (10) comprising an insulative housing (20) having an interior receptacle supporting a plurality of conductive terminals (30), a retainer shield bent to overlie at least three sides of the housing and a retention member (77), and a retainer (40) in the form of a metal shield disposed partially over and retaining the retainer shield (see Fig. 8)." (Page 5, fifth full paragraph, October 22, 2001 Final Rejection). However, for the foregoing reasons stated above with respect to claim 1, Futatsugi et al. does not disclose a connector having a retainer shield and an outer shell member extending over the retainer shield and retaining the shield in its place upon the housing.

In addition, neither Wang nor Matsunuma et al. disclose both a shield member and a separate shell member mounted on a connector housing. Thus, no suggestion of a shell member retaining shield member in its place upon the housing can come from either

of these references. Therefore, as none of the cited references show or suggest a shield member retained in its place upon a housing by a shell member, no combination of the references can show or suggest this feature.

E. The §103(a) Rejection Of Independent Claim 21 Is Incorrect And Should Be Reversed.

Independent claim 21 is directed to a connector having an insulative housing having a body portion with distinct top and bottom wall portions extending therefrom, the connector housing not having any sidewalls interconnecting the top and bottom wall portions, a retainer shield that overlies a portion of said connector housing and has three distinct retention members, each of the retention members extending into the receptacle from a different direction; and an outer metal shell extending partially over the retainer shield to retain the retainer shield in its place upon the housing.

For the foregoing reasons stated above with respect to claim 1, claim 21 should also be allowable. None of the prior art relied upon in the Final Rejection, i.e., Wu et al., Futatsugi et al. or Wang et al. contain any disclosure or suggestion of providing a connector housing having top and bottom wall portions with no side portions connecting the top and bottom portions, enabling retention members of a metal shield overlying the housing to extend at least partially into a space defined by the top and bottom housing portions.

Specifically, the combination of Wu et al. with Futatsugi et al. does not provide a connector having a retainer shield and an “outer metal shell extending partially over the retainer shield to retain the retainer shield in its place upon the housing”, as recited in claim 21 of the present application.

Also, Wang does not show or suggest providing a housing having no sidewalls for purposes of reducing manufacturing costs, as asserted by the Examiner.

F. The §103(a) Rejections Of Dependent Claims 4-9 Are Incorrect And Should Be Reversed.

Claims 4-9 depend from claim 1 and for the foregoing reasons stated above with respect to that claim, claims 4-9 should also be allowable.

As previously stated, claim 1 is directed to a connector having an insulative housing with a body portion and distinct top and bottom wall portions extending from the body portion to define a space, the connector housing not having any sidewalls interconnecting said top and bottom wall portions together, a metal shield that overlies a portion of the connector housing, the shield having three distinct retention members formed thereon, each of the retention members extending at least partially into the space between the connector housing top and bottom wall portions for engaging opposing portions of a mating connector inserted into the space, each of the retention members also extending into the space from a different direction, and an outer metal shell having portions which overlie portions of the connector housing and including two side panels that extend vertically between the connector housing top and bottom wall portions and close off the space therebetween to define a four sided receptacle of the connector with two of the shield retention members being disposed interiorly of the shell side panels, with the metal shield being retained in its place upon the housing by the metal shell. Claims 4-9 sets forth further limitations regarding features formed integral with the metal shell.

For the reasons set forth above with respect to claim 1, the combination relied upon by the Examiner does not supply the missing limitations of applicant's claimed invention, namely a metal shield retained in its place upon the connector housing by the metal shell. As such, claims 4-9, which include additional limitations regarding integrally formed features of the metal shell, patentably distinguishes over the combination relied upon by the Examiner, and the rejection of claims 4-9 cannot be sustained. The reversal of these rejections and the allowance of these claims is therefore requested.

G. The §103(a) Rejection Of Dependent Claim 13 Is Incorrect And Should Be Reversed.

Claim 13 depends from claim 1 and for the foregoing reasons stated above with respect to that claim, claim 13 should also be allowable.

As previously stated, claim 1 is directed to a connector having an insulative housing with a body portion and distinct top and bottom wall portions extending from the body portion to define a space, the connector housing not having any sidewalls interconnecting said top and bottom wall portions together, a metal shield that overlies a

portion of the connector housing, the shield having three distinct retention members formed thereon, each of the retention members extending at least partially into the space between the connector housing top and bottom wall portions for engaging opposing portions of a mating connector inserted into the space, each of the retention members also extending into the space from a different direction, and an outer metal shell having portions which overlie portions of the connector housing and including two side panels that extend vertically between the connector housing top and bottom wall portions and close off the space therebetween to define a four sided receptacle of the connector with two of the shield retention members being disposed interiorly of the shell side panels, with the metal shield being retained in its place upon the housing by the metal shell. Claims 13 sets forth further limitations regarding the orientation of the retention members projecting from the metal shield.

For the reasons set forth above with respect to claim 1, the combination relied upon by the Examiner does not supply the missing limitations of applicant's claimed invention, namely a metal shield retained in its place upon the connector housing by the metal shell. As such, claim 13, which includes the additional limitations that one of the three retention members extends downwardly into the space formed by the receptacle and the other two retention members extend sideways into the space, patentably distinguishes over the combination relied upon by the Examiner, and the rejection of claim 13 cannot be sustained. The reversal of this rejection and the allowance of this claim is therefore requested.

H. The §103(a) Rejection Of Dependent Claim 18 Is Incorrect And Should Be Reversed.

Claim 18 depends from claim 17 and for the foregoing reasons stated above with respect to that claim, claim 18 should also be allowable.

As previously stated, claim 17 is directed to a connector having an insulative housing, the connector housing having distinct top and bottom wall portions defining an interior receptacle, the housing not having any sidewalls interconnecting the top and bottom wall portions together, a retainer shield for shielding a portion of said connector housing, the retainer shield including a body portion that is bent to overlie at least three

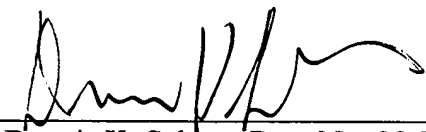
distinct sides of said connector housing and including at least two retention members oriented in distinct vertical and horizontal planes so as to exert a retaining force from two different directions on two different surfaces of a mating connector, and an outer shell member extending partially over the retainer shield, the retainer shield being retained in its place upon the housing by the outer shell member. Claim 18 sets forth further limitations with regard to the number of retention member on the retainer shield and the orientation of the retention members.

For the reasons set forth above with respect to claim 17, the combination relied upon by the Examiner does not supply the missing limitations of applicant's claimed invention, namely a metal shield retained in its place upon the connector housing by the metal shell. As such, claim 18, which includes the additional limitations that the retainer shield includes a third retention member projecting into the connector housing interior receptacle and that two of the three retention members are oriented to each apply a sideways retaining force on a plug connector with the third retention member being oriented to apply a retaining force on a top surface of said plug connector insertion, patentably distinguishes over the combination relied upon by the Examiner, and the rejection of claim 18 cannot be sustained. The reversal of this rejection and the allowance of this claim is therefore requested.

IX. CONCLUSION

For the above reasons, it is respectfully submitted that the Final Rejection of claims 1-11 and 13-21 in the present application should be reversed.

Respectfully submitted,

By: 
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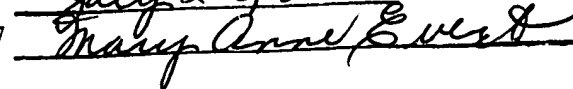
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X. APPENDIX

1. A connector for providing a connection between an opposing connector and a circuit board, the opposing connector having an elongated insertion end for mating with the connector, said connector comprising:

an insulative housing supporting a plurality of conductive terminals, the terminals each having contact portions and tail portions, the tail portions extending outwardly and away from the connector housing, the connector housing having a body portion and distinct top and bottom wall portions extending therefrom, the connector housing top and bottom portions being disposed on said body portion to define a space therebetween adapted to receive said opposing connector insertion portion therein, the contact portions of said terminals being disposed in said space and between said top and bottom wall portions, said connector housing not having any sidewalls interconnecting said top and bottom wall portions together such that said connector housing has a generally U-shaped cross-section;

a retainer comprising a metal shield that overlies a portion of said connector housing, the retainer shield having three distinct retention members formed thereon, each of the retention members extending at least partially into said space between said connector housing top and bottom wall portions for engaging opposing portions of said opposing connector inserted into said space, each of said retention members further extending into said space from three different directions; and

an outer metal shell having a plurality of different panel portions, some of which overlie portions of said connector housing, the shell member having a front face panel that extends vertically between said connector housing top and bottom wall portions, two side panels that extend vertically between said connector housing top and bottom wall portions and close off said space therebetween to define a four sided receptacle of said connector, the front face panel having an opening formed therein that communicates with said receptacle, two of said retention members being disposed interiorly of said side panels and the third of said retention members being disposed interiorly of said connector housing top wall portion, the metal shield being disposed between the metal shell and the connector housing, the metal shield being retained in its place upon the housing by the metal shell.

2. The connector as set forth in claim 1, wherein each of said retention members includes a free end that extends into said space toward said connector housing body portion.

3. The connector as set forth in claim 1, wherein said connector housing top wall member includes an opening formed therein and said third retention member extends through said opening into said receptacle.

4. The connector as set forth in claim 1, wherein said shell include a bottom panel portion integrally formed with said front panel portion.

5. The connector as set forth in claim 4, wherein said shell includes a top panel portion integrally formed with said front panel portion, said top panel portion overlying part of said retainer shield and said connector housing top wall portion, said shell side panel portions being integrally formed with said panel front portion, said top and side panel portions being folded along side edges of said connector housing top wall portion.

6. The connector as set forth in claim 1, wherein said shell front panel portion has a frame portion that extends completely around said opening.

7. The connector as set forth in claim 5, wherein said shell includes a bottom panel portion integrally formed with said front panel portion.

8. The connector as set forth in claim 7, wherein said bottom panel portion and said side panel portions include cooperating engagement means.

9. The connector as set forth in claim 8, wherein said bottom panel portion includes a pair of engagement tabs extending outwardly therefrom and each of said side panel portions includes a slot sized to receive one of said engagement tabs, said

engagement tabs being received within said side panel portion slots when folded around said connector housing.

10. The connector as set forth in claim 1, wherein said retainer shield is formed from a single metal blank having a top portion and two side portions each of which overlie respective opposing portions of said connector housing body portion, a first of said three retention members being formed as part of said retainer shield top portion and a second and third of said three retention members being formed as parts of said retainer shield side portions.

11. The connector as set forth in claim 10, wherein said retainer shield side portions each include a slot separating said second and third retention members therefrom.

13. The connector as set forth in claim 1, wherein one of said three retention members extends downwardly into said space to exert a vertical retention force on said opposing connector when inserted into said receptacle and the other two retention members extend sideways into said space to exert a horizontal retention force on said opposing connector when inserted into said receptacle.

14. The connector as set forth in claim 1, wherein a portion of said outer shell overlies a portion of said retainer shield.

15. The connector as set forth in claim 10, wherein said connector housing top wall portion includes an opening disposed therein that communicates with said receptacle and said first retention member extends through said opening into said space, said first retention member being bent upon itself and extending in said space toward said connector housing

16. The connector as set forth in claim 1, wherein each of said retention members includes a free end that extends in opposition to said connector housing body portion.

17. A receptacle connector for providing electrical connection between an opposing plug connector with a circuit board, the opposing connector having an insertion end for mating with the receptacle of said connector, comprising:

an insulative housing, the connector housing supporting a plurality of conductive terminals, the connector housing having distinct top and bottom wall portions defining an interior receptacle in which said terminals are supported, the receptacle being sized to receive said plug connector insertion end when said plug connector is mated to said receptacle connector, the housing not having any sidewalls interconnecting the top and bottom wall portions together;

a retainer shield for shielding a portion of said connector housing and for engaging a plurality of exterior surfaces of said plug connector insertion end, the retainer shield including a body portion that is bent to overlie at least three distinct sides of said connector housing, said retainer shield further including at least two retention members formed therewith and projecting into said connector housing interior receptacle, said two retention members being oriented in distinct vertical and horizontal planes so as to exert a retaining force from two different directions on two different surfaces of said plug connector insertion end when inserted into said receptacle, and

an outer shell member extending partially over the retainer shield, the retainer shield being retained in its place upon the housing by the outer-shell member.

18. The connector of claim 17, wherein said retainer shield further includes a third retention member formed therewith and projecting into said connector housing interior receptacle, two of said three retention members being oriented to each apply a sideways retaining force on said plug connector insertion end, and the third of said three retention members being oriented to apply a retaining force on a top surface of said plug connector insertion end when inserted into said receptacle.

19. The connector of claim 17, wherein the outer shell member is disposed on the exterior of said connector housing, said outer shell member overlying at least four different surfaces of said connector housing and having a front panel portion with an

opening formed therein that communicates with said connector housing interior receptacle.

20. The connector of claim 19, wherein said outer shell member overlies a portion of said retainer shield and at least partially retains said retainer shield in place on said connector housing.

21. A connector for providing a connection between an opposing connector and a circuit board, the opposing connector having an elongated insertion end for mating with the connector, said connector comprising:

an insulative housing supporting a plurality of conductive terminals, the connector housing having a body portion with distinct top and bottom wall portions extending therefrom, the connector housing top and bottom portions defining a receptacle therebetween adapted to receive said opposing connector insertion portion therein, said connector housing not having any sidewalls interconnecting said top and bottom wall portions and defining part of said receptacle;

a retainer shield that overlies a portion of said connector housing, the retainer shield being formed from metal blank and having three distinct retention members formed therewith, each of the retention members extending at least partially into said receptacle for engaging an opposing portion of said opposing connector inserted into said receptacle, each of said retention members further extending into said receptacle from three different directions; and,

an outer metal shell having a plurality of different panel portions disposed on some portions of said connector housing in overlying relationship, the shell member having a front face panel that extends vertically between said connector housing top and bottom wall portions, two side panels that extend vertically between said connector top and bottom wall portions, the front face panel having an opening formed therein that communicates with said receptacle, two of said retention members being disposed interiorly of said outer shell side panels and the third of said retention members being disposed interiorly of said outer shell and said connector housing top wall portion, the outer metal shell extending partially over the retainer shield to retain the retainer shield in its place upon the housing.